investigate its management decisions, and remedy any deficiencies.

Fourth, a pool of personnel who work in training institutions must be created so that they can actively undertake evaluation of their peers.

Fifth, profiles must be kept of evaluators, who should be selected based on their career experience and ability. Those selected must also receive training in evaluation.

Sixth, training evaluation must be standardized, while the duration of an evaluation should be flexible with respect to the results of each institution.

Seventh, continual efforts should be made to maintain suitable standards of evaluation, which must be decided based on active input from the training institutions themselves. Suggested routes of participation are through vote-counting or revision procedures.

Finally, the accreditation of an individual's ability to evaluate vocational training should be allowed two methods: individual acquisition of national qualifications and collective recognition of the training institutions. Whichever is adopted, it should be enforced through strict regulations.(mskim66@krivet.re.kr)

Accounting for the Stock of Human Capital

RR 00-14

Nam Chul Lee
Euikyoo Lee

Human capital has been represented in several studies by years of schooling, educational attainment, and literacy rates. Years of schooling is so widely used

in the human capital estimates that utilize both aggregate data and micro data. There are two immediate reasons that come to mind.

First, years of schooling are a useful indicator of capital accumulation, particularly when there are no other readily available measures--for either individuals or economy-wide time series. In cross-country comparisons, years of schooling are often the only feasible measure. Second, there is a theoretical argument that indicates that years of schooling are a measure of the stock of human capital under a reasonable set of assumptions.

Years of schooling are far from a perfect measure of the stock of human capital, however. First, estimates of returns to schooling are sensitive to the correct specification of investment costs, but the overall conclusions concerning the importance of schooling are robust. Second, schooling produces only a part of the stock of capital. However, some economists estimate that investment in on-the-job training produces 39 % of the human capital stock.

Educational attainment can be a useful tool for comparing one feature of the human capital stock. However, there are several drawbacks: first, completion of schooling does not certify a consistent set of skills; second, it ignores less formal learning; third, skills can depreciate; and fourth, it can be hard to compare attainment by economic category.

Literacy rates give an indication of educational mobility between generations, which has a bearing both on equality of opportunity and the prospect of improving overall human capital stock. Literacy is a stock variable, but it involves important empirical problems; for instance, it does not account for the contribution of higher levels of education which tend to be crucial to productivity increases and, therefore, to aggregate economic growth.

The issue is simply whether capital should be measured by its market value or by investment costs. The measure suggested in this paper, a labor-income

based measure, uses the market value of capital services to measure the capital stock. It contrasts this measure with the use of the number of years of schooling as an indicator of the stock of human capital.

Using a measure based on educational attainment of the labor force and the share of different groups in labor income, Mulligan and Sala-i-Martin(1995) found that, across the United States, states with the lowest level of human capital stock in the initial period had the highest growth over time. They also found that for the period 1940-90, the stock of human capital grew twice as quickly in the United States than would have indicated by measures based on average years of schooling alone. However, some states, which have lots of schooling, do not have very high stocks of human capital.

Labor-income-based measures of human capital stock only take account of the market value of human capital. There are some drawbacks in the ways in which human capital is computed. One major drawback is that it based on assumptions. Specifically, the relative wage weights used in their construction are a true reflection of productivity differences due to schooling, if labor with different years of schooling is a perfect substitute. The second potential source of problems could be the assumption that the uneducated are perfect substitutes for the rest of the labor force.

Still, all these measures ignore several important factors of human capital accumulation: The experience of the workforce and other elements of human capital investment, parental input, on-the-job training, and health investment, which are likely to be related to the level of schooling investment. Therefore, it is tempting to conclude that all recent studies have used a proxy for human capital that is more or less uncorrelated to the true stock of human capital. Thus, estimates of the effects of schooling investment on earnings can be biased. We extend the Mulligan and Sala-i-Martin approach and present a theoretical model for the stock of human capital for Korea.(nclee@krivet.re.kr)